PISGAH LAKE

Johnson County

2005 Fish Management Report

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EXECUTIVE SUMMARY

- Pisgah Lake is a 62-acre impoundment located on Atterbury Fish and Wildlife Area (FWA) near Edinburgh in southeastern Indiana. It is one of nine small lakes and marshes on the property managed for fishing by the Department of Natural Resources. Access includes two boat ramps; only electric outboards are allowed. A brochure of the property is available by writing to Atterbury FWA, 7970 South Rowe Street, Edinburgh, IN 46124.

- A survey of largemouth bass, bluegill, and gizzard shad was conducted on Pisgah Lake on June 7 and 20, 2005, as part of Division of Fish and Wildlife (DFW) Work Plan 204034, which is titled, "Gizzard shad experimental management strategies." As part of this work plan, Pisgah Lake is scheduled to be surveyed annually through 2009.

- A total of 1,021 fish, representing three species, was collected during this survey. By number, gizzard shad ranked first, followed by bluegill and then largemouth bass. By weight, gizzard shad ranked first, followed by largemouth bass and then bluegill.

- The electrofishing catch rate for gizzard shad was 556.0/h, which is a 59% increase from 2004.

- Bluegill represented a balanced population with fish reaching 6.0 in TL in their 5th year of growth, which is slightly below the average for southeastern Indiana.

- Largemouth bass did not represent a balanced population; bass reached 14.0 in TL in their 5th year of growth, which is above average for southeastern Indiana.

- A selective gizzard shad eradication should be conducted in the fall of 2006 to reduce the number of gizzard shad and to fulfill the directives of the work plan.

- Pisgah Lake should receive a supplemental stocking of 6,200 (100/acre) largemouth bass fingerlings to enhance the predator population following the shad selective.

- In Pisgah Lake, the DFW should maintain a 14-in minimum size limit on largemouth bass, continue to stock 992 (16/acre) channel catfish every 2 years, and continue to control submersed vegetation.

FIGURES

Figure Page

INTRODUCTION

Pisgah Lake is a 62-acre impoundment located on Atterbury Fish and Wildlife Area (FWA) near Edinburgh in southeastern Indiana. It is one of nine small lakes and marshes on the property managed for fishing by the Department of Natural Resources. Construction was completed in 1977. Access includes two boat ramps; only electric outboards are allowed. A brochure of the property is available by writing to Atterbury FWA, 7970 South Rowe Street, Edinburgh, IN 46124.

Pisgah Lake has a 14-in minimum size limit on largemouth bass. Prior fish management activities have included a selective gizzard shad eradication in 2001 and restocking of 12,400 largemouth bass fingerlings. Pisgah Lake is currently stocked with 992 (16/acre) channel catfish every odd year. This survey was conducted to evaluate fish population changes since the last survey in 2004.

Pisgah Lake is scheduled to be surveyed from 2005 through 2009 under Division of Fish and Wildlife (DFW) Work Plan 204034, which is titled, "Gizzard shad experimental management strategies." The work plan objectives are:

1. Report on how the illegal introductions of gizzard shad have negatively affected sport fish populations and reduced fishing opportunities.
2. Determine the most effective way(s) to control excessive gizzard shad populations.
3. Determine how sport fish populations respond to various gizzard shad management techniques.

Pisgah will be surveyed from early to mid-June each year. Only largemouth bass, bluegill, and gizzard shad will be collected. The management activity being tested at Pisgah is a selective gizzard shad eradication every two to three years followed by a supplemental stocking of bass fingerlings.

METHODS

A survey of largemouth bass, bluegill, and gizzard shad was conducted June 7 and 20, 2005, as part of DFW Work Plan 204034. A GPS unit, GARMIN GPSmap 76, was used to record the location of the fish collection sites.

Fish were collected by pulsed DC electrofishing the shoreline on two nights with two dippers for 1.25 h. The lake's shoreline was divided into five, 15-min electrofishing stations.

The odd-numbered stations were sampled the first night and the even-numbered stations were sampled the second night. All fish collected were measured to the nearest 0.1 in TL. Not all gizzard shad collected were measured; the length-frequency distribution and total weight of the entire sample (n=695) was created by applying the percentages by half-in group of the sub-sample (n=450) to the entire sample. Fish were not weighed; average weights for fish by half-in groups for Fish Management District 8 were used to estimate the weight of the fish sample. Fish scale samples were taken from largemouth bass, bluegill, and gizzard shad for age and growth analysis. Proportional stock density (PSD) was calculated for largemouth bass and bluegill (Anderson and Neumann 1996). The Bluegill Fishing Potential (BGFP) index was used to assess bluegill fishing quality (Ball and Tousignant 1996).

RESULTS

A total of 1,021 fish, representing three species, was collected during this survey. Total weight of the fish sample was approximately 456 lbs. By number, gizzard shad ranked first, followed by bluegill and then largemouth bass. By weight, gizzard shad ranked first, followed by largemouth bass and then bluegill.

A total of 695 gizzard shad was sampled that weighed 339 lbs. They ranged in length from 6.1 to 14.8 in TL, averaging 11.1 in TL. Relative abundance was 68% by number and 74% by weight. Back-calculated lengths indicated gizzard shad reached 10.0 in during their second year of growth which (as in 2004) was well above average for southeastern Indiana (Figure 1). The electrofishing catch rate was 556.0/h, which is a 59% increase from 2004 (Lehman and Kowalik 2006).

A total of 211 bluegill was sampled that weighed 26 lbs. They ranged in length from 1.4 to 7.3 in TL, averaging 5.4 in TL. Relative abundance was 21% by number and 6% by weight. The electrofishing catch rate was 168.8/h, which is a 41% decrease from 2004 (Lehman and Kowalik 2006). Bluegill represented a balanced population; the bluegill PSD was 36, which is a 19% increase from 2004. A third of the bluegill in this sample were 6.0 in or longer, which is a 26% increase from 2004. The BGFP index score was 13 (fair), which is a 13% decrease from 2004. Back-calculated lengths indicated bluegill reached 6.0 in (i.e. quality size) during their 5th year of growth, which is slightly below the average for southeastern Indiana (Figure 2). Growth for age-3 and age-4 bluegill has declined since 2004.

A total of 115 largemouth bass was sampled that weighed 91 lbs. They ranged in length from 4.8 to 22.2 in TL, averaging 10.2 in TL. Relative abundance was 11% by number and 20% by weight. The electrofishing catch rate was 92.0/h, which is a 28% increase from 2004 (Lehman and Kowalik 2006). Largemouth did not represent a balanced population; the PSD was 21. Back-calculated lengths indicated largemouth bass reached 14.0 in during their 5th year of growth, which is above average for southeastern Indiana (Figure 3). Largemouth bass growth is slightly below average for age-2 and age-3 fish, but is above average for age 4, age 5, and age 6.

DISCUSSION

In spite of the attempt to selectively exterminate gizzard shad in 2001 at Pisgah Lake, shad are very abundant as seen from both the 2004 and 2005 fishery surveys. The electrofishing catch rate increased from the last survey and was greater than in 1998, yet we believe that shad were greatly under-sampled in 2005. Many shad escaped collection during electrofishing, and we observed numerous young-of-the-year shad under 12-volt lights near the bridge; however, no shad under 6.0 in were collected during the survey. In the 2005 sample, 68% of the fish by number and 74% of the fish by weight were gizzard shad which are of little use to anglers. Gizzard shad directly compete with bluegill and young bass for zooplankton, which can lead to a decline in fishing.

Pisgah Lake continues to provide fishing opportunities for bluegill, although the BGFP index decreased from 2004. Bluegill PSD increased slightly and is still in the desired range, but bluegill catch per effort decreased from 2004, and (as in 2004) no bluegill over 7.5 in were collected. This lack of large bluegill may be the result of angler harvest, a slight decrease in bluegill growth, and/or correlated with the presence of gizzard shad.

Most of the largemouth bass in Pisgah Lake are sublegal fish, so most bass fishing will be catch-and-release; however, bass reached the legal-size limit of 14.0 in faster than the average bass in southeastern Indiana. In the 2004 survey, it was not determined when Pisgah bass reached 14.0 in, for only five of 48 bass (10%) collected via all gear methods were legal size and only two were able to be aged (a 14.7-in bass at age 4 and a 17.1-in bass at age 5).

In 2005, a greater percentage of legal bass was collected and growth was average to above average, but the PSD was below the desired range for a balanced population. This low PSD may be explained by a large 2002 year class that measured between 8.0 and 12.0 in as well

as a very weak 2000 year class. Comparisons cannot be accurately made with 2004, for the PSD in 2004 (40) was not a reliable estimate (i.e. insufficient numbers of bass were collected) (Anderson and Neumann 1996). The 14-in minimum size limit should remain in effect to prevent over-harvest of largemouth bass, the primary source of predation on Pisgah's small panfish and growing gizzard shad population.

We recommend conducting a gizzard shad selective after Labor Day in 2006 to reduce the number of gizzard shad and to fulfill the directives of the work plan. Following the selective, the lake should receive a supplemental stocking of 6,200 (100/acre) largemouth bass fingerlings to enhance the predator population.

RECOMMENDATIONS

- The DFW should maintain the 14-in minimum size limit on largemouth bass at Pisgah Lake.
- A selective gizzard shad eradication should be conducted in the fall of 2006.
- Following the shad selective, Pisgah Lake should receive a supplemental stocking of 6,200 (100/acre) largemouth bass fingerlings.
- The DFW should continue to stock 992 (16/acre) channel catfish every two years. These channel catfish should average at least 8 in long to reduce mortality from bass predation.
- Submersed vegetation should continue to be controlled as needed.

LITERATURE CITED

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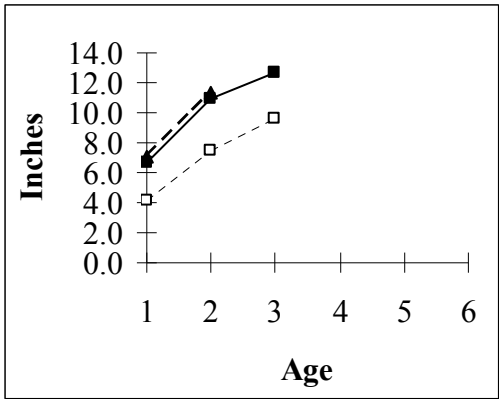

Figure 1. Pisgah gizzard shad growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average gizzard shad growth observed in Fish Management District 8 impoundments (dotted line).

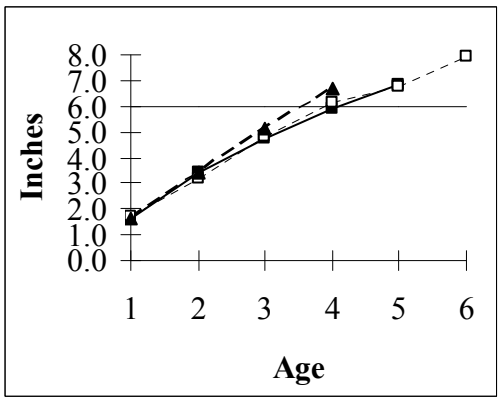

Figure 2. Pisgah bluegill growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average bluegill growth observed in Fish Management District 8 impoundments (dotted line).

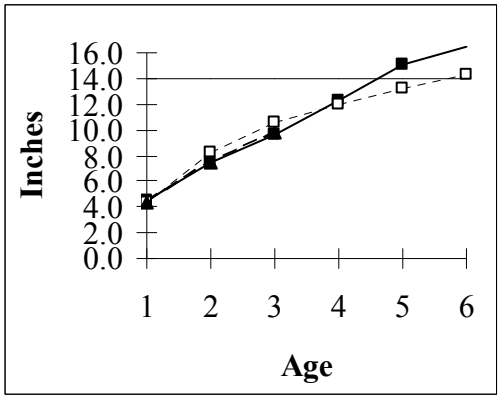

Figure 3. Pisgah largemouth bass from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average largemouth bass growth observed in Fish Management District 8 impoundments (dotted line).